

March 4, 2019

## **Rajesh Kavasseri**

### **March 2019 Researcher of the Month**

Dr. Rajesh Kavasseri is a professor and graduate coordinator in the department of Electrical and Computer Engineering and is an expert in electric power systems and smart and connected communities. He's been at NDSU since earning his PhD in Electrical Engineering from Washington State University at Pullman, Washington in 2002.

While our power grids are immense systems that drive incredible amounts of energy across vast distances, Rajesh notes that they are often taken for granted. "The grid is not just a bunch of wires and towers, behind it is a massive computational

engine that manages electric power which moves at the speed of light," he



says. “Though robust for the most part, it could be fragile at times, especially when stressed”. Much like a set of dominos, if you knock one down, a sequence of events could occur that could jeopardize the entire grid. We are trying to make them resilient so they can learn from their problems, continually gauge, and correct their own operation.”

Rajesh’s concept of smart systems is framed in two components of his research philosophy. He believes that people know when they are wrong with much more confidence than when they are right. He also believes in second chances. While everyone and every system will have faults, they are not as important as the resulting action to correct them. “We are hardwired to listen to our internal compasses that tell us right and wrong. And when we are wrong, we usually know it and we are able to redirect and change course or action. We are integrating these ideas into systems so that they can become resilient.”

Resiliency as a concept provides a wider base of operation for a system as it allows for constant identification and correction of errors. Resilient systems monitor their activity and make selective decisions when they need to adjust to a mistake or bend the rules a bit. “Think of it like a team of football referees,” says Rajesh, “You have a crew watching play on the field but if they miss a call, the booth can jump in and correct the error. All work in harmony to ensure the right calls are made.”

This sort of common sense engineering has been possible by technology that has allowed more wider data streams to be accessed and processed faster than ever before. But Rajesh doesn’t expect to see it widely adopted at first. “While power systems have been smart for some time, the concept of resilience is somewhat new. Given the risk-averse and conservative nature of the electric utility industry, it can sometimes take decades for radically new technical concepts like this to be generally accepted and implemented.”

The concepts of knowing right and wrong and giving second chances are more than just research concepts to Rajesh. He believes that nothing is more

diverse or surprising than the paths we take in life and he welcomes the experiences and changes that they bring to him. "I have always looked forward to the 'ah-ha' moments that life gives me and I've learned from them all, regardless of whether they were positive or negative to me," he said.

Rajesh has been working on an NSF-funded project to develop Smart and Connected Communities. The work has involved collaborators from multiple disciplines including power electronics, electrical materials, architecture, landscape architecture, and visual arts along with five graduate students. The team hopes to learn and develop living spaces that are smart and utilize passive technology to improve power consumption. Rajesh enjoys these types of collaborations because they provide him with insights he may not normally get. "I usually look for collaborators with diverse interests who have a little bit of a maverick streak in them - because that keeps it interesting!" The project has targeted remote and rural communities in North Dakota as they have the same environmental issues that are found across the world.

Both a leader and a collaborator, Rajesh tells new researchers to dream big, to dream wide, and to not be afraid to follow their own curiosity. He shies away from doing what everyone else is doing, or as he puts it, "don't follow the research herd...have a plan and make it your own."

For being both a researcher and proponent of the type of mindset that supports research, Rajesh Kavasseri is our March Researcher of the Month.

[View the RCA Researcher of the Month Archive >>](#)

**Do you mentor undergraduate researchers?**

Encourage your undergraduate students to present at the NDSU EXPLORE Showcase of Undergraduate Research & Creative Activity. This campus-wide event is an opportunity to showcase students' research and creativity. Students present their projects in whatever format is appropriate for their work, whether in a poster, oral presentation, video, table display, or other format. Projects need not be finished; they can be in-progress.

**The 2019 NDSU EXPLORE Showcase will take place Thursday, April 11, 2019.**

For more information, including eligibility, guidelines, award information, and registration, visit the [NDSU EXPLORE webpage](#).



## **RCA Funding Opportunities: Research Support Services**

Funds of up to \$1,000 may be requested to help defray the costs of support services required for research, creative, or scholarly activity. For example, funds may be used in one of the NDSU Core Facilities, another recharge/service center, or for transcription services.

Eligibility: NDSU tenured and tenure-track faculty are eligible to apply. Visiting faculty are not eligible to apply.

Applications should include the following:

- Your name, title, and contact information
- A brief description (1 page) of the request, including the research or scholarly activity being undertaken and whether the work is being performed for a funded project.
- A budget and justification (1 page). Budget items must be reasonable and well justified. The resources needed to complete the project should be described. Unallowable costs include computers, faculty salary, conference travel, office supplies, and facilities and administrative costs (indirect costs).

Applications should be submitted as a PDF file to [ndsu.researchdev@ndsu.edu](mailto:ndsu.researchdev@ndsu.edu).

Applications will be reviewed on an ongoing basis.

**All funds must be spent by July 31, 2019.**

[Visit the RCA Funding Opportunities page >>](#)



### Congratulations to all award recipients from January!

View the complete list online: [PDF](#) | [Excel](#)

The awards listed are externally funded projects. Each month one of the RCA Updates will include prior month awards.

[See Award Reports from previous months >>](#)

## Pivot Has Moved

On March 1, 2019, Pivot moved to <https://pivot.proquest.com> and discontinued the old Pivot URL, <https://pivot.cos.com>. Traffic to cos.com **will not** automatically redirect to the new URL, including any links you have saved. You will need to make changes to saved links.

Be sure to...

- **Change the cos.com portion of any Pivot URL you have saved to proquest.com.** No need to recreate searches or lists if you have saved searches, curated lists, or pivot search widgets on any webpages.
- **Update links on your internal websites, and alert other faculty and researchers of the new URL.**

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# CONTENTS

## FUNDING OPPORTUNITIES

- [ACS: Petroleum Research Fund](#)
- [DoD-Army Materiel Command: Advanced Computing](#)
- [DoD-ONR: Manufacturing Engineering Education Program](#)
- [DOJ-NIJ: Graduate Research Fellowship Program in Social & Behavioral Sciences](#)
- [FM Area Foundation: Community Grants](#)
- [NSF / USDA / NERC / UK: Signals in the Soil](#)
- [NSF / USDA / NIH / DOT / DHS: Cyber-Physical Systems](#)
- [Sanford Health - NDSU Collaborative Research Seed Grant](#)

## EVENTS

- [Agricultural Utilization Research Institute - Reverse Pitch Event](#)
- [Introducing CoSearch NDSU](#)
- [NIH Grant Writing Workshops](#)

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## ACS Petroleum Research Fund

The American Chemical Society (ACS) [Petroleum Research Fund](#) (PRF) offers several research grant programs supporting fundamental research in the petroleum field for both new faculty and established researchers. ACS PRF research grant programs also support development of the next generation of engineers and scientists through advanced scientific education.

Research areas supported include:

- chemistry,
- earth sciences,
- chemical and petroleum engineering, and
- related fields such as polymers and materials science.

ACS Membership is not a requirement or a factor in awarding ACS PRF grants. More information on [ACS PRF Grant Programs](#) that support fundamental research directly related to petroleum or fossil fuels is available on the website, along with application forms and [instructive videos](#).

*Application window: **February 18 - March 15, 2019.***

## DoD-Army Materiel Command: Advanced Computing Initiative

The Department of Defense (DoD) Advanced Computing Initiative (ACI) [[W911NF-19-S-0007](#)] explicitly targets research related to one or more of the following thrust areas:

- Novel Methods of Computing
- Hardware and Software Systems Components
- Exploration of System Concepts
- Algorithms and Architectures

Detailed descriptions of the areas can be found in the RFP, and are intended to provide the applicant a frame of reference and are not meant to be restrictive. Innovative proposals related to these research topics are highly encouraged.

Quantum computing ideas are outside the scope of this opportunity. Proposals will be considered for both single-investigator awards as well as larger teams. A team of investigators may be warranted because the necessary expertise in addressing the multiple facets of the topics may reside within different organizations. The research questions addressed should extend across a fairly broad range of linked issues, where there is clear potential synergy among the contributions of the distinct disciplines represented on the team.

**The application process for this opportunity consists of a concept paper stage and an invited proposal stage.** An applicant invited to submit a proposal will receive feedback on their concept paper that is expected to substantially improve their proposal submission.

*Application deadline: May 31, 2019*



## DoD-ONR: Manufacturing Engineering Education Program

The Department of Defense (DoD), through the Office of Naval Research (ONR), seeks a broad range of consolidated and integrated multidisciplinary programs of education that encompasses the total manufacturing engineering enterprise.

The purpose of this new ONR Manufacturing Engineering Education Program [[N00014-19-S-F006](#)] is to establish new or to enhance existing programs (or collections of programs) to better position the current and next-generation manufacturing workforce to produce military systems and components that assure technological superiority for the DoD.

Interested parties should focus programs on manufacturing education to support one or more distinct manufacturing technologies of DoD interest, for example:

- manufacturing of lightweight structures, systems and materials;
- robotics for manufacturing;
- manufacturing to exploit nanotechnology;
- manufacturing of components and systems for power generation, storage, or distribution; or
- manufacturing of multi-functional electronics and/or optical devices.

Proposed efforts should develop and enhance curricula and programs to effectively develop skills needed for students to operate in multidisciplinary design and manufacturing environments, including those for which manufacturing schema are informed by computational tools for modeling and simulation. Students also should be prepared to work effectively in environments where multiple engineering disciplines are engaged during design, development and manufacturing, and where the roles of manufacturers and suppliers in businesses of various sizes, from start-ups to major systems integrators, are optimized.

Curricula and programs that develop shop-floor capabilities are also sought and may include:

- welding;

- manufacturing-related programming (Computer Numerical Control (CNC), Computer Aided Design (CAD), Programmable Logic Controllers (PLC), logic, robotic control, etc.);
- operation and maintenance of state-of-the-art manufacturing equipment/tooling;
- process monitoring and optimization, and in-line quality assurance; and
- manufacturing, supply chain, and distribution management.

*White Papers due: March 28, 2019; Final applications due: June 20, 2019*

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## **DOJ-NIJ: Graduate Research Fellowship Program in the Social & Behavioral Sciences**

The Department of Justice (DOJ) - National Institute of Justice (NIJ) [Graduate Research Fellowship \(GRF\) Program](#) in Social and Behavioral Sciences is open to doctoral students in all social and behavioral science disciplines. This program provides awards to accredited academic institutions to support graduate research leading to doctoral degrees in areas that are relevant to ensuring public safety, preventing and controlling crime, and ensuring the effective administration of criminal justice in the United States. Of particular interest is research on issues deemed critical by the U.S. Department of Justice:

- violent crime reduction,
- enhancing investigations and prosecutions,
- protecting police officers and other public safety personnel,
- combating the opioid epidemic,
- victimization, and
- addressing illegal immigration.

*Application deadline: April 8, 2019*

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## FM Area Foundation - Limited Submission Program

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more applicants express interest in applying than NDSU is allowed to submit to the grant program.

**FM Area Foundation: Notify RCA by 3/15/2019, 5:00 p.m. if you intend to apply. Your notification must include a half-page description of your project idea. Requirements for this description are as follows:**

- Include the name and contact information of the PI(s).
- Select the target category from those described on the website.
- Identify the target population within the local area of Cass and/or Clay County.
- Indicate the type of project activities involved and the impact to the local community.

All submissions will be reviewed by FM Area Foundation, and up to four will be invited to submit final proposals.

The FM Area Foundation is a community foundation created by and for the people of Cass County, North Dakota, and Clay County, Minnesota. Community Grants are made in the areas of Basic Human Needs; Community Building; Education; Arts, Culture & Creativity; and the Women's Fund. Applicants are advised that projects must have a **community** focus (outside of NDSU). Ideas which focus mainly on NDSU will not be considered. Grant requests from \$500 to \$10,000 will be considered. Pursuant to the new NDSU pilot program, F&A costs (overhead costs) have the option of not being charged for foundation proposals at or below \$10,000.

*Application window: February 27 to May 3, 2019 - depending on category*

## **NSF / USDA / NERC / UK: Signals in the Soil (SitS)**

Soil forms over thousands of years and can be destroyed in a single event. It is a natural asset, alongside water and air, but is often overlooked, despite being the foundation of terrestrial ecosystems that support food production, economic prosperity, and services that are essential for humanity. The National Science Foundation (NSF), in collaboration with the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), the Natural Environment Research Council (NERC), United Kingdom Research and Innovation (UKRI), and other agencies encourage convergent research that transforms existing capabilities in understanding dynamic, near-surface soil processes through advances in sensor systems and modeling [[NSF 19-566](#)]. To accomplish this research, multiple disciplines must converge to produce novel sensors and/or sensing systems of multiple modalities that are adaptable to different environments and collect data and report on a wide range of chemical, biological and physical parameters. This type of approach will also be necessary to develop next generation soil models, wireless communication and cyber systems capabilities, and to grow a scientific community that is able to address complex problems through education and outreach. This program fosters collaboration among the partner agencies and the researchers they support by combining resources and funding for the most innovative and high-impact projects that address their respective missions.

**Each proposal must have at least one eligible collaborator from the US and one eligible collaborator from the UK. The Lead PI MUST be a US-eligible collaborator. Only US collaborators can be listed as a PI or a co-PI. The UK collaborator(s) must be listed as non-funded Senior Personnel.**

*Application deadline: May 15, 2019*

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## **NSF / USDA / NIH / DOT / DHS: Cyber-Physical Systems**

This program is administered jointly by multiple federal agencies. [Cyber-physical systems \(CPS\)](#) are engineered systems that are built from, and depend upon, the

seamless integration of computation and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability that will expand the horizons of these critical systems. CPS technologies are transforming the way people interact with engineered systems, just as the Internet has transformed the way people interact with information. New, smart CPS drive innovation and competition in a range of application domains including agriculture, aeronautics, building design, civil infrastructure, energy, environmental quality, healthcare and personalized medicine, manufacturing, and transportation. Moreover, the integration of artificial intelligence with CPS creates new research opportunities with major societal implications. While tremendous progress has been made in advancing CPS technologies, the demand for innovation across application domains is driving the need to accelerate fundamental research to keep pace. At the same time, the CPS program seeks to open new vistas for the research community to think beyond the usual cyber-physical paradigms and structures and propose creative ideas to address the myriad challenges of today's systems as well as those of the future that have not yet been designed or fielded. Proposals for three classes of research and education projects—differing in scope and goals—will be considered through this solicitation:

- **Small** projects may request a total budget of up to \$500,000 for a period of up to 3 years. They are well suited to emerging new and innovative ideas that may have high impact on the field of CPS.
- **Medium** projects may request a total budget ranging from \$500,001 to \$1,200,000 for a period of up to 3 years. They are well suited to multi-disciplinary projects that accomplish clear goals requiring integrated perspectives spanning the disciplines.
- **Frontier** projects must address clearly identified critical CPS challenges that cannot be achieved by a set of smaller projects. Furthermore, Frontier projects should also look to push the boundaries of CPS well beyond today's systems and capabilities. Funding may be requested for a total of \$1,200,001 to \$7,000,000 for a period of 4 to 5 years. Note that the Frontier project submission window is different than that for Small and Medium projects.

*Application window for small and medium projects: April 1 - April 12, 2019*  
*Application deadline for Frontier projects: September 12, 2019*

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## **Sanford Health - NDSU Collaborative Research Seed Grant Program**

The fifth Sanford Health - NDSU Collaborative Research Seed Grant program's Request for Applications (RFA) has been released. Proposals are to be submitted electronically to [NDSU.BusinessDev@ndsu.edu](mailto:NDSU.BusinessDev@ndsu.edu) by 5:00 PM on March 19, 2019. The full RFA and Application form can be downloaded from the [program's webpage](#).

Questions regarding suitability of topic areas, collaborating with Sanford, or other program-related questions can be addressed by Business Development (231-6660 or [NDSU.businessdev@ndsu.edu](mailto:NDSU.businessdev@ndsu.edu)).

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## **Agricultural Utilization Research Institute - Reverse Pitch Event**

On **March 27**, some of the world's largest food and agricultural companies will gather to present "reverse pitches" to an audience of researchers, entrepreneurs, innovators and subject-matter experts. The businesses will talk about distinctive industry challenges and invite the audience to propose solutions.

The Reverse Pitch Showcase and networking event will be at the **Marriott West in Minneapolis** and is free and open to the public. A registration link and additional information is available at [auri.org](http://auri.org). Those who cannot attend will be able to watch on a live web stream broadcast.

Challenge areas to be covered include:

- Sustainability Solutions for the Food Sector
- Farm Management Software Data Incentives
- Traceability of Food Safety and Quality Issues
- Alternative Ingredients and Functional Benefits
- Virtual Reality Financial Benchmarking
- Improvements in Animal Production Incentives
- Regenerative Agricultural Practices for Animal Production
- Ag Processing Efficiencies
- Pesticide Application Innovations
- Improved Pest Detection in Stored Food Products
- Packaging Innovations
- New uses for Dairy Byproducts
- New Food Product Development
- Improved Food Sensory Attributes
- Practical Food Applications to Improve Human Nutrition and Health



## Introducing CoSearch NDSU: April 12 & 13

On **April 12 and 13th**, NDSU researchers will have 30 hours to share a research idea, hone the idea with an interdisciplinary team they meet at the event and pitch the idea to a panel of judges.

The broad theme of this inaugural NDSU CoSearch event is **The Farm of the Future**. This is an exciting opportunity for researchers from a variety of disciplines to bring their perspectives on how our communities and state look and function as farms transform in the coming decades.

CoSearch is open to all faculty members who are interested in collaboration, research, and solving real world problems. In just 30 hours, you will create, hone and launch a research project that could be funded. The event begins at the Research Park Friday afternoon with the final showcase at Elevate on Broadway in downtown Fargo.

CoSearch is free for the first 30 participants. No team or existing idea is needed to participate. Join and you will find a team and create in idea. The event is being hosted through a partnership between the College of Business, Emerging Prairie, and the Office of Research and Creative Activity.

[More information >>](#)

[Register to Participate >>](#)

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## NIH Grant Writing Workshops

On April 25, Dr. Meg Bouvier [ [Meg Bouvier Medical Writing](#) ] will present three workshops:

### How to Write an NIH R-Series Application

Thursday, April 25, 2019 | 8am-1pm | Memorial Union Hidatsa Room

*The target audience for this session is NIH [R01](#) and [R15](#) grant program applicants.*

This workshop will cover the following topic areas:

- **Preparation:** *Key steps to take before you write a successful NIH submission*
- **Specific Aims:** *How to write the most important page of an NIH submission*
- **Significance and Innovation:** *How to “sell” your project to NIH reviewers*
- **Approach:** *How to write the section that correlates most closely with your overall score*

### **Mistakes Commonly Made on NIH Submissions**

**Thursday, April 25, 2019 | 1pm-2pm | Memorial Union Arikara Room**

*This lunch-time session covers mistakes commonly made on NIH submissions, and will include a question and answer period with Dr. Bouvier.*

### **Building Your Biomedical Research Funding Portfolio**

**Thursday, April 25, 2019 | 2pm-3pm | Memorial Union Hidatsa Room**

*This session will discuss funding options including those outside NIH that could help build and diversify your funding portfolio.*

Seating is limited, and priority will be given to faculty.

**Registration is required.**

[Register for a workshop >>](#)

These workshops are co-sponsored by the Research and Creative Activity Office and the Center for Diagnostic and Therapeutic Strategies in Pancreatic Cancer.

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Have questions, ideas, or suggestions for the RCA Update?

[Contact Us](#)

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*The Office of Research and Creative Activity (RCA) sends weekly emails to NDSU faculty and staff to provide current information on various topics including funding opportunities, grant program changes, research resources, deadlines, notices, and training.*

*You are receiving this notification through the NDSU official employee listserv or sub-list. The official listserv refreshes after each pay period.*

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